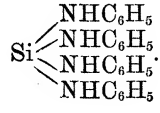
So far, cases were only dealt with in which silicon tetrabromide combined with nitrogenised groups without loss of its halogen. The next stage of the inquiry involved the investigation of certain interactions in which the tetrabromide loses *all* its halogen. One of the chief results obtained in that direction forms the subject of a separate communication which accompanies this Report.

III. "Preliminary Note on a Silico-organic Compound of a New Type." By J. EMERSON REYNOLDS, M.D., F.R.S., Professor of Chemistry, University of Dublin. Received September 27, 1888.

The subject of this note is a fine crystalline substance, and is the first well-defined compound yet known in which we have reason to believe that silicon is in direct and exclusive union with the nitrogen of amidic groups. Its analysis and mode of formation lead to the conclusion that it is *silicotetraphenylamide*,



This body is produced when silicon tetrabromide (or the tetrachloride) is added to excess of aniline, diluted with three or four volumes of benzene. Aniline hydrobromate (or hydrochlorate) is a secondary product of interaction and separates, being insoluble in benzene. If aniline be in excess throughout the operation, the whole of the halogen precipitates as aniline salt, and there remains in solution impure silicotetraphenylamide. If aniline be not in excess, a bromo-compound is obtained analogous to Harden's rather ill-defined chlorinated product.

Distillation from a water-bath readily removes benzene from the solution, and a liquid remains which solidifies after some time to a yellowish mass. The latter dissolves in warm carbon disulphide leaving a residue containing some thiocarbanilide, and cautious evaporation of the solution leads to the separation of magnificent crystals of the silicon compound. These form chiefly at the surface of the liquid, as they are specifically lighter than the solution.

When twice recrystallised from carbon disulphide, the substance is obtained in a state of purity.*

* A large quantity was prepared in June last, and about 50 grams of the pure compound were exhibited on September 11th, in Section B, during the meeting of the British Association at Bath.

The crystals of silicotetraphenylamide are perfectly colourless short prisms of considerable size. They melt at 136—137° to a transparent liquid, which can be heated to 210° without decomposition. On cooling this liquid solidifies to a transparent glass which, like the original crystals, can be easily decomposed by water.

If silicotetraphenylamide be heated under diminished pressure (about 80 mm.), it affords a distillate of aniline, and leaves a residue which seems to be the silicon analogue of *carbodiphenylimide;* but the latter has not yet been completely analysed.

The detailed investigation of the new substance and its derivatives is in active progress, and promises to throw light on the hitherto obscure relations of silicon and nitrogen.

I have reason to believe that the homologues of aniline, and certain other analogous nitrogen compounds, act like excess of aniline on the silicon haloids, and produce substances similar to the subject of this note. These reactions are also being investigated in my laboratory.

IV. "On the Magnetisation of Iron and other Magnetic Metals in very strong Fields." By J. A. Ewing, B.Sc., F.R.S., Professor of Engineering in University College, Dundee, and William Low. Received October 29, 1888.

(Abstract.)

Early in 1887 the authors communicated to the Royal Society the results of experiments made by subjecting iron to strong magnetic force by placing the sample, in the form of a bobbin with a short narrow neck and conical ends, between the pole-pieces of an electro-magnet. The experiments have been continued and extended by using much stronger magnetic forces and by testing samples of nickel, cobalt, and various steels, as well as wrought iron and cast iron. The large magnet of the Edinburgh University Laboratory, kindly lent by Professor Tait, was used throughout the experiments, and allowed the authors to effect a high concentration of the magnetic force by using bobbins the necks of which had a cross-sectional area of (in some cases) only $\frac{1}{1500}$ of the cross-sectional area of the magnet cores. By this means the induction $\mathfrak{B}$ was raised to the following extreme values:—

In wrought iron	45,350	c.g.s.
„ cast iron	31,760	„
„ Bessemer steel	39,880	„
„ Vickers' tool steel	35,820	„
„ Hadfield's manganese steel	14,790	„
„ nickel	21,070	„
„ cobalt	30,210	„